ODICAL ROOM
ERAL LIBRARY
NIV. OF

THE JOURNAL OF PHILOSOPHY

VOL. XX. NO. 6: MARCH 15, 1923

CONTENTS

Facts, Systems, and the Unity of the World: C. I. LEWIS 141

Change and the Unchanging Whole: A New Scientific Analogy: J. E. TURNER 151

Book Reviews:

Pound's The Spirit of the Common Law: MORRIS R. COHEN 155

Oxford Translation of Aristotle's De Caelo and De Generatione et Corruptione: HERBERT W. SCHNEIDER 165

Coburn's Heredity of Wildness and Savageness in Mice: HALSEY J. BAGG 166

Journals and New Books 167

Notes and News 168

PUBLISHED FORTNIGHTLY

THE JOURNAL OF PHILOSOPHY

All communications to the Editors should be addressed to PROFESSOR FREDERICK J. E. WOODBRIDGE, or PROFESSOR WENDELL T. BUSH, Columbia University, New York City.

Subscriptions and advertisements should be sent to THE JOURNAL OF PHILOSOPHY Sub-Station 84, New York City. The annual subscription price (twenty-six numbers) is $4.00 and the charge for single numbers is 20 cents. Advertising rates will be forwarded on application.

The Journal of Philosophy is owned and published by Frederick J. E. Woodbridge and Wendell T. Bush, at Lancaster, Pa.

Entered as second class matter, March 18, 1921, at the Post Office at Lancaster, Pa. under Act of Congress of March 3, 1879.

Publishers: WILLIAMS & NORGATE - London; WILLIAMS & WILKINS CO. - Baltimore; FÉLIX ALCAN - Paris; NICOLA ZANICHELLI - Bologna; RUIZ HERMANOS - Madrid; THE MARUZEN COMPANY - Tokyo

"SCIENTIA" INTERNATIONAL REVIEW OF SCIENTIFIC SYNTHESIS
Issued Monthly (each number consisting of 100 to 120 pages).
Editor: EUGENIO RIGNANO.

IT IS THE ONLY REVIEW, which has a really international collaboration.

IT IS THE ONLY REVIEW, of absolutely world-wide circulation.

IT IS THE ONLY REVIEW, occupying itself with the synthesis and unification of knowledge, which deals with the fundamental questions of all the sciences: history of the sciences, mathematics, astronomy, geology, physics, chemistry, biology, psychology and sociology.

IT IS THE ONLY REVIEW, which, by means of enquiries among the most eminent scientists and writers (on: *The philosophical principles of the various sciences; The most fundamental astronomical and physical questions of current interest; The contribution given by the various countries to the different branches of knowledge; The question of vitalism; The social question; The great international questions raised by the world war*), makes a study of the most important questions interesting scientific and intellectual circles throughout the world.

It has published articles by Messrs.:

Abbot - Arrhenius - Ashley - Bayliss - Beichmann - Beneš - Bigourdan - Bohlin - Bohn - Bonnesen - Borel - Bottazzi - Bouty - Bragg - Brillouin - Bruni - Burdick - Carracido - Carver - Castelnuovo - Caullery - Chamberlin - Charlier - Ciamician - Claparède - Clark - Costantin - Crommelin - Crowther - Darwin - Delage - De Martonne - De Vries - Durkheim - Eddington - Edgeworth - Emery - Enriques - Fabry - Findlay - Fisher - Foà - Fowler - Fredericq - Galeotti - Golgi - Gregory - Guignebert - Harper - Hartog - Heiberg - Hinks - Hopkins - Iñiguez - Innes - Janet - Jespersen - Kapteyn - Karpinski - Kaye - Kidd - Knibbs - Langevin - Lebedew - Lloyd Morgan - Lodge - Loisy - Lorentz - Loria - Lowell - MacBride - Matruchot - Maunder - Meillet - Moret - Muir - Pareto - Peano - Pearl - Perrin - Picard - Pigou - Plans - Poincaré - Puiseux - Rabaud - Reuterskjöld - Rey Pastor - Righi - Rignano - Russell - Rutherford - Sagnac - Sarton - Sayce - Schiaparelli - Scott - See - Seligman - Shapley - Sherrington - Soddy - Starling - Stojanovich - Struycken - Svedberg - Tannery - Teixeira - Thalbitzer - Thomson - Thorndike - Turner - Vinogradoff - Volterra - Von Zeipel - Webb - Weiss - Westermarck - Wicksell - Willey - Xénopol - Zeeman - Zeuthen and more than a hundred others.

"Scientia" publishes its articles in the language of its authors, and joins to the principal text a supplement containing the French translations of all the articles that are not in French. (*Write for a Specimen Number to the General Secretary of "Scientia," Milan, sending—simply to defray postal and other expenses—2 francs in stamps of your country.*)

ANNUAL SUBSCRIPTION: sh. 40: $10, post free. OFFICE: **Via A. Bertani, 14** (Italy). *General Secretary:* Doct. PAOLO BONETTI.

VOL. XX., No. 6 MARCH 15, 1923

THE JOURNAL OF PHILOSOPHY

FACTS, SYSTEMS, AND THE UNITY OF THE WORLD

THE purely logical approach to metaphysical problems is somewhat out of fashion. High *priori* grounds and necessary being are threatened with banishment. Yet metaphysics is relatively little concerned with the particular, and there is a considerable portion of it which has to do only with what would be true of any world which is logically conceivable. The issues of pluralism or monism, internal and external relations, the character of the individual, the relation of datum and object, and the nature of truth, all turn upon such considerations. Moreover, the advances of logic in recent years, especially with reference to the structure of systems, is capable of shedding new light on these problems: and there is one logical method of attacking them which has never been properly exploited. It is the purpose of this paper to illustrate that method by applying it to one of the central problems of metaphysics, the problem of the unity of the world. As we shall see, a perfectly definite answer can thus be given to the question whether and in what sense reality is one or many, and the considerations which afford this answer are unusually free from doubt.

Most metaphysical studies have begun by taking the world as constituted of objects or individual things. Undoubtedly the world is such an array of objects, of some sort or other. But this approach to the problem is inauspicious for two reasons: first, because no object is or can be exhaustively known: and second, because this procedure immediately involves us in questions about the relations of objects, which are highly complex and divert the discussion promptly to subordinate issues.

It is equally true that the world is a system of facts, taking "fact" to indicate that which a proposition (some actual or possible proposition) denotes or asserts. That the world can be exhaustively construed as an array of such facts follows from this; if there were any phase, part, or aspect of the real not comprised in some fact, then the real would contain what could not be stated or asserted, and hence could neither be known nor imagined, guessed at nor inquired about. So far at least as the real is intelligible, it is constituted of facts and their relations. In the array of all facts, objects and their relations will be comprehended, just as all facts

would be determined in the array of objects. Hence either of these methods must lead to the same results in the end. But the approach through facts may succeed where the other fails because of the simpler relation of fact to knowledge. The *object* always transcends our particular knowledge or judgment—as the whole transcends the part, or the real transcends the apparent, or as the complex structure transcends its simpler and more superficial elements. But the *fact* is, by its very nature, the unit of knowledge. It represents exactly that which thought can surely grasp in judgment and express in a proposition, that which our knowledge can completely possess or surround. Moreover, the relations of facts are simpler to deal with because they are at once the relations treated by the logic of propositions: facts may imply one another, as propositions imply one another, and facts are compatible or incompatible, as are the propositions which express them. Such relations are comparatively simple in type, and we possess the technique adequate to deal with them.

But the logic of facts is hampered at the outset by a difficulty of terminology. Ordinarily the word "fact" is restricted to that which a *true* proposition denotes. But in addition to the form of words which asserts or means, there is that which is asserted or meant, as much when the statement is false as when it is true. And lacking some word to indicate this objective or designatum of a proposition, without respect to its truth or falsity, there are certain problems which it is difficult to discuss at all. Let us, then, stretch the word "fact" to this meaning, by omitting its usual connotation of truth, and intend by it simply what a proposition—some proposition—asserts. When it is desirable to distinguish what is denoted by true propositions exclusively, we may speak of "actual facts." This is not to assign to "unreal facts" any dubious metaphysical status; it is merely a convenience of language. Just as it is immaterial whether we say that "Kilkenny cat" denotes no object or that what it denotes is unreal, so it is merely a question of propriety or convention whether we shall say that "All the world is apple pie" asserts what is not a fact or that the fact which it asserts is non-actual. The second choice of language is the more convenient because the logical relations of facts are unaltered by their actuality or non-actuality, just as the logical relations of propositions are unaffected by their truth or falsity.[1]

The properties of facts which are metaphysically important are all due to their interrelation in systems, or complexes which possess

[1] If space and continuity permitted, it would be in place here to discuss the various types of fact, particularly positive and negative (which does not coincide with the distinction of affirmative and negative propositions), as well as the relations of facts to "things" and to "events." But there is no horrid mystery in these matters if we do not go about it to make one.

some definite structure. The notion of system, especially in its connection with knowledge and truth and with the nature of the real, has played a most important rôle in philosophy. "Systematic unity," "organization," "deductive system," "coherence"—the significance of such conceptions requires no comment. But the notion of "system" ("deductive system" excepted) has usually been very vague, and when definite, highly special or complicated. For the most important metaphysical consequences, we find that the simplest and most comprehensive meaning of "system" is the only one which is required. In the meaning which we shall assign, any set of facts constitute a system if they meet the following requirements:

(1) If A is a fact of a given system—call it Σ—and A is inconsistent or incompatible with B, then B is not in Σ.

(2) If C is in Σ, and C requires or implies D, then D also is in Σ.[2]

(3) If E and F are facts in Σ, then Σ contains also the joint-fact EF.

This third condition is relatively unimportant; it is the correlate of the obvious truth that whenever two propositions are asserted separately, the proposition which states both together can be asserted.[3]

Systems are, then, sets of mutually consistent facts such that whatever system contains a given fact will contain also all the consequences of that fact. No idea of order or arrangement is here intended, and it is not essential that such systems be constructed or constituted by any mental operation. The logical relations of facts exist whether anyone notes those relations or not; that A is consistent with B, or follows from B, is something which we do not create, but discover.

To each system of facts will correspond the system of the propositions which assert those facts. Deductive systems will be amongst those thus defined; indeed, systems in general will correspond exactly with all the different sets of propositions which could be generated by deduction (in each case from a set of consistent assumptions) if the assumptions of a system were allowed to be as numerous as you please. But there are other systems than those which would ordinarily be thought of as deductive. It is a significant consideration that any part of our knowledge, as well as our knowledge as a whole, must determine such a system. The *logical* conditions of truth are here summed up. What we truly know of physics, of space, of biological

[2] "Implies" is here used in its ordinary meaning, which the writer has elsewhere discussed as "strict implication." A is "inconsistent" or "incompatible" with B if A implies the falsity of B or B the falsity of A.

[3] The insertion of this condition is necessary only because A and B together may imply C when neither alone implies C. A system will contain not only the logical consequences of each of its facts separately, but also the consequences of any combination of them.

forms, or of the world altogether, will determine a system. But we must be careful here to say "determine" and not "constitute." We are never aware of all the logical consequences of what we know: our knowledge fixates a whole system of facts but can not possibly exhaust it.

We know a great deal about the properties of systems in general, largely because deductive systems are special cases which are included. Some of these characteristics can be pointed out without lengthy discussion. First, there is more than one such system. Second, one system may contain another; all the propositions or facts of one may belong also to the other. (As the term is here used, however, two systems consisting throughout of identical facts will be identical systems, regardless of any notion of deductive order.) Third, two systems may be such that they have some facts in common, although the further facts in each are incompatible or inconsistent with those of the other. For example, Euclidean and a non-Euclidean geometry will have all those propositions in common which follow from their postulates without the parallel-postulate, or postulate concerning coplanars.[4] But in two such geometries the postulate concerning coplanars, and most of the propositions which follow from it, are different in the two systems, and those of the one are incompatible with those of the other. From these commonplaces, which need no demonstration, follow consequences of the first importance, in particular that the same fact *A* may be consistent both with another, *B*, and with the contradictory of *B*. Some facts are independent even though they should be jointly true. This is often overlooked or even denied in metaphysics.

However, the existence of facts which are independent of given systems does not immediately settle the question of the structure of reality, because it may be claimed—and often is claimed—that this independence is due to the limited character of the system; that the plurality of systems and independence of facts disappears when we consider reality as a whole, and that as the organization of actual facts becomes more and more adequate we approach a single unitary system all of whose parts stand in relations of rigid necessity and such that no actual fact can be independent of it. It is precisely this notion that every fact of our world is somehow determined by every other—that reality has no independent parts—which we find to be false. But admittedly, any conceivable world will be more complex than most systems, and it will be infinitely more complex than those systems, such as geometries, which have hitherto been adequately investi-

[4] *I.e.*, when geometry is taken in the concrete, as the truth about space, and identical terms have the same definitive meaning.

gated. Hence, to elucidate the issues of our problem, we must consider the structure of "possible worlds."

Any conceivable world is a system, since all its facts must be mutually consistent, and any consequence of facts in it will also be a fact in it. But not every system is a world. If we speak of facts which are asserted by propositions which contradict one another as "contradictory facts," the difference between a world and a system which is not a world lies in this, that a system may omit both a fact and its contradictory—as a geometry omits both the existence of the color blue and anything contrary to it—while a world must contain one or other of every contradictory pair. The law of contradiction holds of a system, but the law of the excluded middle does not. A world, however, must satisfy both these laws; it must be such that every proposition is either definitely true or definitely false of it. In other words, a system which is not a world (a mathematical system, for example) will be indeterminate in ways which no possible world could be.

We may, then, call any set of facts a "possible world" if it meets the following requirements:

(I) If A is a fact of a given world—call it Ω—and A is incompatible with B, then B is not in Ω.

(II) If C is not in Ω, then the contradictory of C is in Ω.

(III) If E and F are in Ω, then Ω contains also the joint-fact EF.

Conditions (I) and (III) for worlds are identical with (1) and (3) for systems, but condition (II) is more comprehensive than (2), which follows from (I) and (II), as the reader will readily see.

It is obvious that a given system may be contained in more than one possible world. This relation of a system to any world which includes it is the more important because it is the relation of knowledge to reality. The problem of knowledge (the practical, not the epistemological problem) turns largely upon this, that the facts which are accepted as belonging to the actual world, and thus constitute our knowledge at any given moment, determine a system (if we are fortunate enough to avoid inconsistency), but we can hardly suppose that they determine a world. The advance of empirical knowledge enlarges our system by the addition of new facts which may be independent of previous knowledge, and we approach the world of reality by means of such an ever-growing system. But we never reach the point of discovering *which* of various equally possible completions of our system of known facts the actual world is. So far as we can determine, *the real world is always merely one of many which must be viewed as equally possible.*

It is precisely this situation which is reflected in the use of inference. When we infer from our previous experience, instead of turn-

ing to new data, we make a psychological addition to our knowledge which is trustworthy simply because the conclusion will be true of *any possible* world which contains the facts stated in the premises. "If *A*, then *B*," may be translated, "Any world in which *A* should be true and *B* false, is impossible," or, "Any possible world which contains *A* must also contain *B*." Where inference is impotent and we wait upon further evidence, the addition to our knowledge which is sought must consist of independent facts, not contained in the system which our knowledge determines.

No one will ever discover all the consequences of what he knows, so that we can not say offhand whether the system determined by anyone's knowledge is adequate to a world or not. But the supposition that all truth (including details about prehistoric individuals, facts about the invisible stars, *etc.*) could be determined without further experience or anything beyond the implications of what we already know, is a conception so fantastic as hardly to deserve consideration. Certain arguments for metaphysical monism seem to make precisely this claim, but in a form which suggests a confusion of facts with objects. If one say, "The logical consequences of what I now know include all fact and all reality," we must observe the evident ambiguity of the world "what." *What* I know, is a real object in all its complexity; what I *know*, is merely a limited and superficial set of facts pertaining to this object. If we could know our object completely, it may be that our knowledge would determine all reality—that is another question. The "flower in the crannied wall" or "the bit of chalk I hold in my hand" may be a microcosm of reality; but our facts do not thereby extend to all reality since they comprise only a few characters of this microcosm. I may be assured that "when I drop this chalk I shake the farthest star," but that does not enable me to calculate the perturbations of Mercury. Our meagre knowledge of the individual thing does *not* imply all actual fact; and as for the object, it implies nothing. Only facts and assertions can have implications.

Such arguments, turning upon the relations of objects, have frequently been adduced to prove for the world that kind of unity which makes every part depend upon every other part or upon the whole. And this in turn has been construed to mean that everything in the world is necessarily as it is, and every fact of it a necessary fact. The question of the relations of objects, whether external or internal, we here omit from consideration. But we shall now proceed to demonstrate that, regarded as a complex of facts, the world can not have this kind of unity. Since the argument is a bit involved, let us outline it in advance: I. If any world is logically conceivable, then more than one is logically conceivable; because (*a*) every self-

consistent system must be contained in or "true of" at least one possible world, and (*b*) there are systems, equally self-consistent, which can not be true of the *same* world. II. Every possible world will contain some facts in common with any other. Hence, III, the actual world contains some facts in common with worlds which are conceivable but not actual. Therefore, IV, reality can not be such that all its facts are necessary and necessarily related. It is characteristic of the real world to contain facts which are mutually independent or "external."

Consider any system—call it $\Sigma(o)$—and any proposition, p. Either the propositions in $\Sigma(o)$ imply p, or they imply its contradictory, not-p, or they imply neither. In the last case, p is completely independent of $\Sigma(o)$; both p and not-p are compatible with the system as a whole. Hence if $\Sigma(o)$ is self-consistent, then it already contains p, or it contains the denial of p, or either of these may be adjoined to it and the resulting enlarged system will also be self-consistent. Any other proposition, q, will be related to the system $\Sigma(o, p)$ or the system $\Sigma(o,$ not-$p)$ in precisely similar fashion: if neither q nor not-q is contained in $\Sigma(o, p)$, then the systems $\Sigma(o, p, q)$ and $\Sigma(o, p,$ not-$q)$ are both self-consistent.

We should like to go on and say: Therefore one or other of every contradictory pair of propositions, neither of which is contained in $\Sigma(o)$, can be adjoined to it, and *the result will describe a possible world of which* $\Sigma(o)$ *is "true."* That we can not say this is due to two considerations; first, if p and q are both independent of $\Sigma(o)$ and independent of each other, still q may not be independent of $\Sigma(o, p)$ or $\Sigma(o,$ not-$p)$. Hence in expanding our system in the direction of a possible world, of which it shall be "true," we can deal with independent propositions only one at a time. And second, the multitude of facts or propositions is such that no one-at-a-time process can ever exhaust them. The collection of all facts has a magnitude at least as great as that of any set of entities whatever—so great that, to put it in paradox, there can be no such number. One of *every* contradictory pair can consistently be adjoined to $\Sigma(o)$, but in such a case this does not mean that one or other of *all* pairs can be so adjoined. However, it does mean that of all the facts that ever will be known, guessed or merely hazarded, doubted or denied or put in question, one or other of all the contradictory pairs belongs together with $\Sigma(o)$ in a self-consistent system. The limitation of our proof is simply the limitation of possible knowledge in general. No conceivable knowledge can ever be adequate to a world: the notion of Reality or The Universe is simply a regulative ideal of reason in the Kantian sense. And our argument *is* sufficient to prove that if there be any self-consistent system which

is *not* true of some possible world, then that fact itself is forever beyond all knowledge. In the only sense in which we can speak of a world at all, whether actual or possible, there is a possible world for every self-consistent system.

For greater clarity, we repeat the gist of this in illustration. Let the original system be Riemann's geometry. Either Riemann's geometry contains, when all its implications are developed, the law of gravitation, or it contains the proposition which states the falsity of that law, or this law is completely independent of the system. In the third case, the system is compatible both with the law and with its being false. Supposing that it is thus independent, we may adjoin either the law or its denial to the geometry to form a new system which will also be self-consistent. In precisely the same fashion any other proposition—say the law of Mendelian inheritance—is either contained in this enlarged system, or its denial is contained, or the proposition and the system are mutually independent and either Mendel's law or its denial may consistently be adjoined. Every mentionable proposition can be similarly dealt with. Thus, so far as any conceivable knowledge or guesswork can ever go, Riemann's geometry is true of a logically conceivable world.

If this were not the case, then there must be some proposition, X, such that the statement "Either X is true or X is false" will of itself imply the falsity of the system as a whole, and the system is not self-consistent. A similar remark applies to all the other geometries, interpreted in whatever terms, and to every system whatsoever. So long as we accept the self-consistency of mutually incompatible systems, such as rival geometries, we are bound to maintain that more than one world is logically conceivable. Whoever would deny this may rightfully be challenged to produce the proposition X and prove the inconsistency—the purely logical inconsistency—of all the geometries but one. But as is well known, the correspondences between Riemann's or Lobachevsky's and a modernized Euclid are such that if one fails of self-consistency the other must also.

Second, every world which is logically conceivable will have something in common with every other. For if this were not the case, there could be at most only two such worlds, the world of all the propositions actually true, and the world consisting of the denials of each of these propositions. But the contradictories of true propositions are not all consistent *with each other* and could not describe a possible world. Therefore, either there is only one such world—which has been disproved—or every such world has something in common with every other.

Third, since every world which is logically conceivable has something in common with every other, every world, including the actual one, contains mutually independent parts.[5]

Let the system of propositions common to two possible worlds, Ω_1 and Ω_2, be designated by $\Sigma(\omega_1\ \omega_2)$, and let the propositions which are true of Ω_1, but false of Ω_2, be designated by $\Sigma(\omega_1 - \omega_2)$. These two systems are both contained in Ω_1. And no proposition of $\Sigma(\omega_1 - \omega_2)$ follows from the propositions in $\Sigma(\omega_1\ \omega_2)$, because in Ω_2 all the propositions of $\Sigma(\omega_1\ \omega_2)$ are true, but those of $\Sigma(\omega_1 - \omega_2)$ are false. If we compare Ω_1 and another possible world, Ω_3, we must find similarly that Ω_1 contains an independent part $\Sigma(\omega_1 - \omega_3)$, which is not the same as $\Sigma(\omega_1 - \omega_2)$, for in that case Ω_2 and Ω_3 would be identical.

Thus any possible world—in our illustration Ω_1—must contain independent parts or systems of facts, which will be more or less numerous according to the number of other possible worlds with which it has something in common. Since the number of possible worlds is at least as great as the number of self-consistent and mutually incompatible systems, the structure of any possible world, and hence of ours, can be determined from the number of mutually incompatible systems. If there should be n such systems, then every possible world must be such that it can be divided into independent parts in at least n different ways. And if the number of such systems should exceed 2^n, then every possible world will contain at least $n + 1$ systems each of which is completely independent of all the others. The reasons for these particular mathematical relations may be omitted, since it is sufficient for our present purpose to note that in general the number of independent parts in any possible world must increase as the number of mutually incompatible systems increases.

But we know that there are an *infinite* number of such mutually incompatible systems. To choose the simplest confirmation, Riemann demonstrated that there are an infinite number of geometries, each inconsistent, as a complete system, with every other, and every one of them consistent in itself and logically as sound as Euclid. In various other ways also, it might be demonstrated that the number of mutually incompatible systems is infinite. The only question is whether it is simply infinite, like the natural numbers, or an infinity of a higher order. Hence it follows necessarily that reality contains an infinite number of independent parts, or logically independent sets of facts. Such formal demonstration does not make

[5] There is one system which is contained in *every* possible world and hence is not an independent part of any—a consideration which it is not necessary to go into here.

us see *how* this is so (and we hope that no one will attach any esoteric meaning to our procedure), but *that* it is so admits of no rational doubt.

It would be easy, however, to misapprehend the nature of this necessary pluralism. The world is *not* such that, given any one of its facts, all the others are thereby determined. But no matter how numerous the possible worlds may be, any one of them, including the actual, may be a closed system in the sense of having no single fact in it which is not determined by other facts of it. Indeed it is difficult to see how this could fail to be the case. Even relatively simple systems have this character. Identically the same system may be generated by two sets of postulates having no members in common. The postulates of the one set will all follow as theorems from those of the other. Hence in such a system there is no proposition which is not a consequence of other propositions in the system. Yet some of the propositions in it may be independent of others; in particular, each postulate may be independent of the other postulates; and hence some of its propositions may belong also to another system, even though the two systems as a whole are mutually incompatible and each has this "closed" character. Thus nothing in the preceding forbids the notion that the actual world is a very tight system of interlaced facts. On the other hand, that every actual fact depends upon other such facts (as is highly probable), is very far from meaning that all actual facts are "necessary" or their contraries inconceivable. The issues of monism or pluralism have frequently been taken in a somewhat rough and ready fashion. As they are usually stated, the truth lies somewhere between them.

These considerations have an important bearing upon the connection between coherence and truth. "Coherence" is a very vague term. If it be taken to mean the relation between the various parts or members of a system, still that does not cure its vagueness, since this relation may be that of logical consequence or simply the relation of consistency without dependence. Such relations of consistency with, or dependence upon, other accepted facts constitute the only criteria of truth which are available, so long as we do not find or call upon further empirical evidence. And when the various limitations of sense-knowledge are remarked, the importance of these relations is apparent. But compatibility with other facts is only a negative, never a sufficient and determining condition. Even that every fact is implied by others in the system does not determine truth. Each of the facts of Euclidean geometry is coherent with the other facts of it; it follows from these others. Yet that does not serve to verify a single proposition. It does not even mean that Euclidean geometry must be accepted or rejected as a whole.

Some portion of Euclid may be true of our space and the rest entirely false. The selection of a set of propositions acceptance of which would commit us to the system as a whole is a very nice matter. And when it is accomplished, we have made a beginning toward splitting up the whole system, in various ways, into sets which can be accepted or rejected independently. Since any of these independent sets or subsystems may belong to or be true of a different possible world, it is obvious to how limited an extent coherence is a sufficient test of truth.

A pluralism of "incoherence" is false, if coherence means consistency. Mutually incompatible propositions *ipso facto* can not be true of the same world unless that world be alogical—whatever that may mean. But a monism which identifies the necessary with the actual, the actual and the all-possible, is incompatible with conceptions which are logically fundamental.

C. I. LEWIS.

HARVARD UNIVERSITY.

CHANGE AND THE UNCHANGING WHOLE: A NEW SCIENTIFIC ANALOGY.

IN his recent *Meeting of Extremes in Contemporary Philosophy* Dr. Bosanquet has given special prominence to the problem of "time, progress and change in the universe." Here we face "the ultimate crux of speculation. There is nothing so difficult as this problem";[1] throughout the discussion of the last few decades it has divided thinkers into two great opposed schools. Just as, in America, William James charged those who denied the ultimate reality of change with maintaining a rigid "block universe," so in France Bergson has argued that such a view negates from the outset all possibility of newness and creativeness; *tout est donné.* More recently again, Dean Inge's Presidential Address to the Aristotelian Society also deals with the nature of the time series;[2] the subject, indeed, is perennial and fundamental.

I do not intend, however, to discuss the problem in any detail. But it seems to me that the recent development of purely scientific thought, in connection with the theory of relativity,[3] removes at least one weighty objection that has repeatedly been advanced against the principle of the changeless Whole, in so far as this is taken to render illusory or impossible the occurrence of change

[1] P. 125.

[2] *Proceedings*, Vol. XXI.

[3] In view of current discussion, it may still be necessary to point out that only the physical theory is here referred to, and not any strictly philosophical principle of relativity.

within the sphere of our actual experience. We now have, on the contrary, what is—to say the least—a striking and valuable scientific analogy to the philosophic concept of the unchanging Whole as the ultimate form of Reality, which is not merely in harmony with the actuality of all temporal changes, but which is positively demanded as their logical and indispensable basis.

The familiar antithesis may be summarized thus: If the Whole is real, then change, in any form that is equally real, must be ruled out in advance; while if, on the other hand, we accept the reality of change, then we are at once debarred from maintaining the existence of a true Whole. At first sight it would seem that modern Physics is the least likely field in which to anticipate any working idea of the Whole. For, as contrasted with the more concrete sciences, and still more in comparison with history and religion, Physics is devoid of any dominating and persistent systems such as the main natural orders in Biology, or societies and nations in History. Its ruling categories are unceasing change and transformation, and to these such stable systems as it recognizes are only secondary and subordinate. But the method of dealing with time which is distinctive of the new theory of relativity, instead of emphasizing—as we might expect—this opposition between wholeness and change, has made it possible, if not indeed necessary, to subsume change and development under the still profounder concept of a Whole. The most definite expression of this new principle is that given by Dr. E. Cunningham. In referring to the now familiar "unity between the categories of space and time," he points out that "a universe of determinate relations, in which everything proceeds according to known laws, is one that may be surveyed as a great whole in which past, present, and future are one. It is a four-dimensional unity. . . . The history of a particle is a simple chain of points in that whole."[4] Here it is essential to notice that the whole which is thus implied is a *temporal and dynamic* whole. It is by no means, that is to say, a merely static system comparable to the "block universe" of James. It includes, on the contrary, as indispensable elements both time and ordered process; for "everything proceeds according to known laws." In itself the principle that is here involved is not a new one; it is illustrated in every graphic representation of any temporal series of changes. None the less this striking expansion of a long-familiar method—its current application to the all-inclusive totality of physical processes—possesses a profound significance for philosophic speculation. For we find that while change is still retained in all its earlier essentiality, that element of contradiction between development and wholeness which has been

[4] *Nature*, Vol. 106, p. 786.

so frequently insisted upon as fundamental and ineradicable has now disappeared altogether. The Whole, as such, has become an equally essential factor; and Physics, even in investigating and expressing incessant change, is dealing also with a Whole that is equally indispensable to its modern spirit and method of enquiry.

Here it may be objected that although the Whole, thus posited for the purpose or as the outcome of theory, is a necessity for our thought, still this is quite a different matter from establishing its actual existence. This point raises the old problem of the true relation between necessary thought and real being, which again can not be treated here in any detail. But it is permissible, I think, to cite the rapidly increasing adequacy of trains of argument, which are in themselves purely mathematical and logical, although they always repose on a foundation in concrete experience, to the thoroughgoing investigation and the far-reaching prediction of natural phenomena. Examples of this tendency abound on all sides; the completed theory of relativity is, indeed, its most remarkable instance. Scientists are the most consistent of pragmatists; and they would certainly not commit themselves more and more to mathematical methods unless they were conscious, either implicitly or explicitly, that there always exists some fundamental connection between the pure logical prevision of their science and the concrete processes of Nature. Thus we find, to cite another recent case, that "mathematical difficulties connected with the problem of three bodies prohibit us from investigating the possible radiation from an atom containing more than one electron and a nucleus."[5] Here it is plainly implied that conclusions that are found to be mathematically necessary may, *primâ facie*, be relied upon as descriptive of natural systems and their transformations.

There is, therefore, no *logical* difficulty in regarding the conceptual Whole which is posited by relativity Physics as truly representing an existential Whole. But if with this conception we ally further Einstein's principle that the universe must be physically finite, and also the reality of gravitational influence, then the parallelism with the philosophic Whole of modern Idealism becomes more remarkable still. Neither of these additional considerations raises any insuperable obstacle to the course of my argument. To take gravitation first of all, as being the simpler subject, it is altogether erroneous to suppose that it has either been explained, or explained away; all such views arise from misapprehending the character and purpose of Einstein's general theory. It is impossible here to enter into the scientific details; it must be sufficient to point out that the theory—at least in its original form—deals with gravita-

[5] *Science Progress*, Oct., 1921, p. 233.

tional phenomena under the purely abstract aspect of their kinematical character; as Dr. Cunningham has expressed this, "gravitational problems are"—so far as relativity theory is concerned—"problems of acceleration."[6] We find further that Einstein now holds that the "metrical qualities" of the continuum "are partly conditioned by the matter *outside* of the territory under consideration,"[7] thus recognizing something closely akin to the older view of gravitation.

Secondly, the universe, in Einstein's view, is physically finite. It is true that he calls its finitude "spatial"; but the term "space" has now acquired a distinctly limited and specific meaning. "Space," we find, "is endowed with physical qualities; in this sense there exists an ether. Space without ether is unthinkable"; and it is in this sense, and *this sense only*, that Einstein maintains that the universe is "spatially unbounded and of finite magnitude."[8] It is thus perfectly plain—and the point is of the highest philosophic importance—that "space" here means much more than pure extension. Extensional finitude must be clearly distinguished from this physical finitude. Relativitists are concerned with a universe that is *physically* finite; by which is meant a system of matter, or energy, or ether, or "space endowed with physical qualities," which is not an infinite system; and we have thus, curiously enough, a modern parallel to the familiar Cartesian identification of matter and extension.

If then we regard gravitation as a real influence which is—as is most probably the case—instantaneous in its operations, it follows that all gravitational phenomena are the effects of a permanent and universally distributed condition of stress throughout the finite universe; they are manifestations of an omnipresent but locally variant property of the omnipresent ether, such that every localized modification is instantaneously compensated at all other points. I do not think that I am here outrunning the scientific constable, upon whom it behoves all philosophic thinkers to keep a wary eye. The idea seems wholly in consonance with Dr. Whitehead's recent concept of "ingression." "Each object is ingredient throughout nature; an electric charge is everywhere. The modifica-

[6] *Nature, loc. cit.*, p. 785.

[7] *Sidelights on Relativity*, p. 18. My italics.

[8] *Ibid.*, pp. 23, 21. *Cf.* also p. 41. Contrast with this position Einstein's earlier statement, "We entirely shun the vague word space." (*Theory of Relativity*, p. 9.) *Cf.* also, "In [Weyl's] geometry space is a form of phenomena, not a mere continuum of n dimensions." (Professor Eddington in *Nature*, Vol. 109, p. 635.)

tion of the field at every point of space at each instant . . . is another way of stating the same fact.''[9]

What then, in conclusion, is the philosophic import of these scientific investigations? It appears to me to be extremely significant and valuable. The finite universe, in the first place, is here presented to us as a definite existential Whole. Secondly, in so far as the universal ethereal stress is its permanent and omnipresent characteristic, it is an *unchanging* Whole—inconceivable and unreal when taken apart from this attribute, as we have seen from Einstein's treatment of his problem. But the final and most important consequence is that this system of physical reality, just *because* it is thus unchangingly stressed, must contain within itself incessant change in the form of gravitational phenomena—change which is the direct result of the unchanging nature of the Whole, paradoxical though this conclusion appears to be. Nor is it illogical to surmise that these physical transformations are all coördinated towards some definite end. Thus we obtain a remarkable illustration (to say no more) of the well-known Idealist principle of a changeless Whole which is nevertheless the basis of all the changes in the world of our experience.

J. E. TURNER.

LIVERPOOL, ENGLAND.

BOOK REVIEWS

The Spirit of the Common Law. ROSCOE POUND. Boston: Marshall Jones Company. 1921. pp. xiv + 224.

This is a book of primary importance, written by the one legal scholar in America who for a number of years has been working to build up a modern philosophy of law. Perhaps it would be more correct to say that Dean Pound has sought to build up a philosophical jurisprudence rather than a philosophy of law—*i.e.*, he has sought to make the science of law as philosophical or reflectively rational as possible rather than to answer the questions which one primarily interested in philosophy would ask concerning the rôle of the law in a unified theory of human life and natural existence. In any case, this book, endeavoring to define the spirit of the common law as a method of thinking, is of primary importance to philosophers interested in the methods actually pursued in one of the major adventures of the human spirit. It may not be irrelevant to mention here that Dean Pound has not only endeavored to study the law in the light of modern social science, but has also

[9] *The Concept of Nature*, pp. 145, 146. *Cf.* this JOURNAL, Vol. XIX, p. 146.

brought to his task a mind trained in the natural science of botany where he has rendered distinguished service.

I

The Spirit of the Common Law is, in the main, an analytical-historical survey of the leading ideas which have moulded the common law in America, concluding with two chapters illustrative of the essentials of the process of judicial empiricism and legal reason. According to this survey, six factors have tended to make the common law in America unusually individualistic. Two of these—the old seventeenth- and eighteenth-century theory of natural rights and the philosophy of free will and *laissez-faire* of the nineteenth century—have been operative in all modern civilized countries. Two others—the character of primitive Germanic law and the struggle of the English courts against the Stuart kings—have influenced English as well as American law; while two others—Puritanism and the condition of people living in a sparsely settled country with an open frontier—have given a peculiar turn to the individualism of American law.[1] At the same time the social or integrating principle represented by feudalism has never ceased to operate and the tendency to think of rights and duties not as inhering in the separate individual but as attached to a given relation,[2] has never departed from the common law and has even distinguished it from the modern Roman law of Europe.

The extent of this survey shows Dean Pound to be remarkably free from the currently fashionable but logically despicable habit of trying to refute doctrines by their chronology. Instead of dismissing doctrines as mediæval or eighteenth-century, he analyzes their actual operation and seeks to extricate their permanently valuable elements while vigorously pointing out those effects which have been actually baneful. This same scientific sanity also shows itself in the refusal to be stampeded for or against the term individualism, but seeks a just estimate of the extent to which free individual initiative is essential to social welfare.

Dean Pound has himself at times characterized his philosophic position as pragmatic. This is certainly true in the field of ethics to the extent that pragmatism is a continuation of social utilitarianism represented in law by Jhering. However, as a logician and

[1] I am not sure to what extent Dean Pound thinks that Puritanism has also influenced the law of England. He speaks of the age of Coke—which is the age of the Elizabethan dramatists, Marlowe, Shakespeare and Ben Jonson—as the age of the Puritan in England. But he gives no indication of how the English common law was modified by Puritanism.

[2] *Cf.* Bradley's *My station and its duties, or the recent concept of the social function of various acts or transactions.*

especially as a legal historian, Dean Pound is decidedly neo-Hegelian, showing markedly the influence of Kohler in emphasizing the ideologic factor. Though he is remarkably liberal in his conception of the variety of the factors that determine legal development, and though he believes that the sociologic jurist should seek the conditions and motives back of legal ideas, he nevertheless insists that the chiefest factor in legal development is to be found in the logical force of the analogy or analogies that chance to be at hand. This tends to minimize the importance of political, economic, and other social factors and to characterize different periods of legal development almost exclusively in terms of single dominant ideas. Thus he speaks abstractly of the triumph of the common law in the twelfth century where others might see the masterful personality of Henry II fighting Thomas à Becket, or of its triumph in Tudor times over Roman law where others would see the triumph of organized corporations of lawyers in the Inns of Court. Similarly, he refers to the views of the Spanish jurist-theologians without any intimation that we are dealing with the utterances of Jesuits in the struggle of the Papacy against the Protestant princes. No one can well dispute Dean Pound's contention that social phenomena are complex and may be viewed from different angles. At times, however, he seems to argue as if the presence of ethical motives and logical reasons proves that economic forces were not influential. This is clearly an inadequate view since logical, ethical, and economic considerations are not mutually exclusive. There is a large mass of evidence to show that our honest convictions are largely moulded by the interests of the class to which we belong. We see justice clearer in cases where our sympathy has been developed by our particular experience. In large measure men act first and justify their acts afterwards. Also as men's material environment differs, the analogies that seem to them most cogent differ. I have heard of an estimable judge who came from a small rural community and talked of the employment contract as analogous to swapping two cows for a horse. Such an analogy would not occur or would not have much force to one in contact with the realities of modern factory employment.

Dean Pound seems to me to have been unduly repelled against the economic interpretation of legal history by the superficial arguments used in its defence by men like Brooks Adams. There is certainly no reason for denying the elementary fact that economic factors influence the law as they mould other human institutions. The law of fixtures, the limited rights of combinations of laborers, the duties of employers to employees, the limited liability of shipowners, as well as the greater penalties for crimes against property

than for most crimes against the person, readily occur as illustrations of where the law protects the interest of one class against that of others. Indeed, the whole law of property may be viewed from this point of view. For the law does not merely protect possessions acquired in a pre-legal stage. It largely determines how the future social product shall be distributed. Hence the struggle for economic advantages can not be kept out of the law.

Not only as a student of logic but as one who believes that no greater calamity could happen to human life than the complete triumph of anti-intellectualism, I can only express my personal delight at the great importance which Dean Pound assigns to the ideologic element in the making of the law. Nevertheless, the method of ideologic history has its marked logical danger. For the ideas emitted in the course of any human struggle are never meant to be actually carried to their full logical consequences, as if they were the premises of some geometric system. The reasons we give to justify our practical aims always take the form of premises much wider than the demands of these immediate aims. (This is, I suppose, what is meant by the current term "rationalization.") Hence the meaning of dominant ideas in the historic realm is always in fact limited in ways incomprehensible without a knowledge of the actual conditions and motives under which they arise. Ample historical learning and good sense generally enable Dean Pound to avoid this logical danger of the ideologic method. In the last chapter he lessens the emphasis on purely jural analogies and explicitly maintains that legal changes are not always caused by legal phenomena (p. 213), and that the function of the legal historian is to illustrate how rules and principles have met concrete social conditions rather than to furnish self-sufficient legal premises. In the chapter on "The Pioneers and the Law" he has also given us a model treatment of concrete social, economic interpretation of legal development. Nevertheless, it seems to me necessary, in view of Dean Pound's obvious enthusiasm for Kohler, to repeat the old warning against identifying historical epochs with certain ideas which develop from each other by an imminent Hegelian dialectic. To seek for the leading idea dominating a given country and period may be a useful way of organizing our material. But when it is reified or hypostatized it makes us ignore or minimize the actual diversity of conflicting ideals that in any time or place actually prevail. A good illustration of this is Dean Pound's assertion that the nineteenth century demanded that the law should stand still. In fact, however, the demand for change was vocal enough in certain classes of the population. It was only the resistance of very definite and more powerful interests that prevented any change.

Nor are the practical conclusions of Neo-Hegelian ideology always safe—witness Kohler's defence of the retributive theory of punishment.

In a book like this, intended for a general audience, certain undefined general terms like individualism are necessary or at least unavoidable; and I think that the context generally indicates Dean Pound's meaning clearly enough. Nevertheless, the unwary reader is likely to be somewhat misled by the use of a term like individualism in connection with things as diverse as primitive Germanic law, Puritanism, the philosophy of natural rights and free-will, and the character of life on a frontier. A good deal of the "individualism" of primitive law is but apathy and fear of interfering with what the gods have brought about—something altogether different from the reformist passion to liberate the energies of human personality. One is also apt to be somewhat confused when told that the strict Germanic law, unlike the more mature Roman law, was individualistic (pp. 17–18), and yet that Roman law is individualistic when compared with the essentially Germanic feudal law (pp. 21–22). Indeed, feudalism which regarded sovereignty as a matter of contract and public office as private property (a view which prevailed in some of our southern states up to the Civil War) may in this respect be regarded as extreme individualism.

The identification of Puritanism with individualism offers several historical difficulties. I can not see that distrust of magistrates was ever characteristic of the Puritans in this country. The remarks of Pastor Robinson about "consociation" may be challenged in this connection on the ground that Robinson was a Pilgrim, *i.e.*, a Separatist and a believer in toleration, which was certainly not the position of the Puritans. The latter, as followers of Calvin, did not believe in toleration, any more than in free-will; and in their constant emphasis on "the discipline" they certainly magnified the power of magistrates to regulate the personal life in minute ways. Moreover, when the common law came to be moulded in America at the end of the eighteenth century, Puritanism had been definitely checked by Deism and other liberal movements, witness the life of Benjamin Franklin. Of the men who may be said to have laid the foundations of the American common law, Coke, Blackstone, James Wilson, Marshall, Gibson, Kant, and Story, only one, or at most two, can be characterized as Puritans. A reference, also, to the Puritans who settled in the West Indies (Barbadoes, *etc.*) tends to indicate that the individualistic features of our common law which Dean Pound attributes to Puritanism may be rather due to the sparsely settled conditions of the country. To this day the demand for excessive regulation of the moral life of our fellow

beings is more characteristic of rural than of urban communities, though sumptuary legislation is found under the most diverse conditions.

II

The last two chapters, entitled respectively "Judicial Empiricism" and "Legal Reason," are more particularly devoted to the illustration of the process according to which law grows. This process is in the highest degree instructive to philosophers who wish to see the interplay of variable and relatively constant elements in actual operation. The substantive rules of the common law are constantly changing not only through the introduction of new premises by the legislature, but even more so by the gradual and persistent modifications effected by jurists and judges in the guise of finding, interpreting, and applying the law. In this flux continuity is assured both by intellectual habit, which makes it easier for the judge to decide all similar cases in the same way, and by the social need for certainty, which demands of the judge that he shall decide according to some definite principle on which people can rely in their conduct. The permanent or perduring element of the common law is to be found, therefore, not in any of its substantive rules, but in its character as a method of legal thinking. (By permanent we obviously mean constant throughout a relatively long span of time.) Dean Pound puts the permanent features of the common law in (1) the system of judicial empiricism by precedents, (2) trial by jury; and (3) the supremacy of the law. From this list we may omit trial by jury of which little is said in this volume and which does not prevail in equity procedure by which a great many of the fundamental rights of labor and capital are actually determined to-day. Let us consider the other two features.

(1) The widespread assertion that common-law judges are absolutely bound by precedent can certainly not be maintained in an unqualified form. If it were true, the law could never be changed, as it constantly is, by judicial decision. When lawyers speak of the principle or *ratio decidendi* established by a case, the logician rightly objects that a particular case can never uniquely determine the principle from which it is deduced. (The neglect of this is the familiar fallacy of affirming the consequence.) Dean Pound, therefore, more correctly speaks of precedents as analogies. Since in a developed legal system we generally have more than one analogy in a given case, the judge's decision is not necessitated entirely by logical deduction, but is largely influenced by judicial tact and sense for the weight of competing analogies. Judicial decision, then, is an art not entirely necessitated by strict logic. As in other

arts, certain modes or habits are generally viewed as binding. But the maxim that judges must consider themselves as absolutely bound by precedents is obviously a fiction which tends to limit the judges' personal opinion of right and wrong and thus to insure greater stability by forcing on his attention the analogies of previously adjudicated cases. As a fiction it thus compels a certain amount of enlightenment or intellectual consideration. But as no two cases are absolutely alike, the process of distinguishing any case from preceding ones enables the law to retain its fluidity. Dean Pound can thus maintain that our common-law system in which the judge is ruled by precedents is more fluid than the continental system in which the law is fixed largely by theoretical jurists who systematically elaborate the provisions of written codes. *A priori* this seems plausible. (The compactness of this volume doubtless prevents Dean Pound from bringing in the detailed evidence for this contention.) The jurist, like other theorists, is apt to ignore many practical considerations in his proud zeal for consistency. On the other hand a great American lawyer has likened the common-law judge to an experimenter in chemistry who must rely on records of previous experiments "but who is not ready enough to admit that the record of former experiments may be wrong." Judged by the amount of litigation in this country as compared with that which prevails in countries governed by Roman law, there is reason to believe that where the jurist plays a greater part, the law receives a more logical development and is therefore more certain and litigation less frequent. Many have held that the doctrine of precedents is an expression of the empirical temper of the Anglo-Saxons which prefer muddling along rather than relying on preconceived principles and orderly plans made in advance—a distinction strikingly illustrated when we compare English with French books on mathematics. But, whatever truth there may be in this, the main distinction is the one laid down by Pound, *viz.*, that the common law puts the judge while the others put the jurist in supreme control of legal development. This distinction, however, must not be made too hard-and-fast. For jurists and especially text-book writers have had a tremendous influence on the actual growth of our common law, witness Wigmore's *Treatise on Evidence* or Bishop on *Marriage and Divorce*. On the other hand, as the decisions of French and German courts are being reported and commented on, they are bound to be influential, even though formally their authority may be disputed. The greater dignity of the judge in common-law countries is due to the fact that England became an organized central monarchy long before other European

countries, and the King's courts therefore acquired predominance earlier.

This brings us to the second point, the supremacy of the common law.

(2) The phrase "supremacy" or "sovereignty of the law" is often used to denote the supremacy within the state's courts of the laws sanctioned by the state over any other laws such as those of private corporations, churches, *etc.* Obviously, if the judge were free to set aside the law of the state whenever in the judgment of one of the parties it conflicted with religion, morality, or public policy, we should cease to have any legal system at all. The supremacy of the law in this sense is thus a jural ideal or postulate. The courts may, in fact, unintentionally or even intentionally exceed the large element of discretion accorded to them; and the unwieldy machinery or impeachment may or may not be brought into play. But the decision will stand in any case by virtue of the supremacy of the law used in a moral-political sense, to wit, that it is the duty of every citizen or government official to obey the final decision of the court whatever that may be. As a political maxim this is of great general force because the most crying abuses brought about by legal authority generally involve less danger to the state than reversion to anarchic or lawless justice. Nevertheless, we have no right to make this maxim absolute. For the actual law, as administered by human beings of limited intelligence and limited good will, always involves more or less injustice and immorality. Hence at critical times, it becomes the ethical duty of individuals or of communities to disregard the law in the interests of justice and human welfare. To refuse to do so is to disregard the maxim that the Sabbath is made for man and not man for the Sabbath—a dangerous saying, but necessary to save us from the deadly blight of pharisaic legalism.

When Dean Pound uses the phrase "the supremacy of the law," he seems in the main to insist that in making and administering the law judges must be independent of the political sovereign, king, parliament, or the voters. This again is a political proposition of great expediency. For judges are experts like engineers and physicians and it is generally undesirable for the lay sovereign to interfere in professional matters. Dean Pound, however, does not seem to be satisfied to treat this merely as a matter of *general* expediency. Some of the arguments he uses in its defense border close on absolutism, as when he justifies Coke's dictum that judges rule under God and the law. Whatever ancient peoples may have believed, there is no rational ground to-day for the view that the work of judges is more divine than the work of other men. (Coke

himself was an outrageously vile character.) Nor is there any reason why the community should not have the right to reject the work of judges just as it has the right to reject the work of engineers or educators. Of course it can do so only at its peril. But there is also peril in complacent acceptance of irresponsible rule by a judicial or any other aristocracy of experts.

At times, Dean Pound indicates clearly enough that judges are engaged in a task of social engineering imposed upon them by the community; from which it would seem to follow that, like other social functionaries, they should be responsible or answerable to the community for the results of their work. This responsibility, however, tends to disappear practically (*i.e.*, it becomes a responsibility to God only) when we insist, as Dean Pound does, that the work of courts is reason and that all political interference with them is caprice. Doubtless if we use reason in the sense made familiar by Santayana, as the organization of human life and expression so that our impulses will tend to fulfill themselves in harmonious rather than in discordant ways, then law with its orderly procedure for hearing both sides and critically examining the relevant evidence certainly deserves to be called organized reason. But we must not forget that actual law is a human product—made and administered by judges who are not free from human limitations in intelligence and good will. To make, therefore, a categoric identification of law with reason tends to ignore these limitations and to encourage the kind of legal optimism which Blackstone made famous or infamous. Indeed, to identify the actual with the ideal is the essence of all fanaticism, of idolatry in religion, bigotry in morals, and absolutism in politics. Dean Pound himself has sufficiently pointed out the actual specific evils into which the law has fallen by virtue of this claim to absolute supremacy. It has, for instance, enabled fortified monopolies to prey upon society and has hindered the development of the personality of the laborer. Indeed, he has also pointed out a serious defect in the fundamental structure of our legal system which prevents its work from being as rational as that of some of our political agencies. Thus, courts have very limited sources of knowledge. They can not possibly give the time that many important measures before them really demand, and they can not delegate their power. They must decide between the two parties before them and have no means of studying the full effect of their decision on third parties. Above all, they have no power of initiating investigation and framing rules in advance. In view of these limitations I can not see how one can justify the view that any movement away from judicial to executive or legislative justice is necessarily arbitrary and irrational.

Dean Pound's unqualified opposition to all political interference with the work of the courts seems to me especially unfortunate in a country like the United States, where every political issue except the tariff sooner or later comes up before the courts. In no other advanced civilized country are purely political questions like taxation, labor legislation, *etc.*, rendered so uncertain because of the difficulty of knowing how the courts, the final authorities, will decide. Dean Pound makes a great point of the fact that some British dominions are beginning to follow our method of giving the courts power to declare certain statutes unconstitutional. This, however, seems a minor matter so long as these constitutions do not contain our bills of rights, fourteenth amendment, and essentially vague terms like due process, equal protection of law, liberty, direct taxation, republican form of government, *etc.*—terms whose essential vagueness gives the courts as much power as they wish to take over all political issues.

In opposing all popular or political review of the work of the courts, Dean Pound relies heavily on the fact that judges are members of a learned profession, and that the criticism of their decision by their fellow members can be relied on to cure the shortcomings of their work. No one can doubt that criticism from one's fellow professionals is much more powerful than criticism from the public at large (though the latter is never completely negligible). In these days of rampant irrationalism it is well to meet Dean Pound's courageous faith in the power of science which makes him believe that improved legal training will cure the radical evils of our legal system. But it is not necessary to reject this faith to see its obvious limitations. Professional legal opinion is class opinion, and every class of experts has its special limitations. (This is altogether apart from the fact that the leaders of the bar are as a rule in the service of clients of those propertied classes that can afford to pay the highest fees.) History is full of instances of opposition to needed reforms on the part of the legal profession. Substantial improvements in legal justice have generally required pressure from outside the legal profession. This is true even in the realm of procedure. The old common-law forms of pleading, for instance, long continued to defeat the ends of justice because of their attractiveness from the point of view of technical finesse. The danger of absolutistic ideas is precisely in that they limit us to only one way (usually the traditional one) whereas life demands many ways. Here again I must add that no one has shown more carefully than Dean Pound himself the necessity of vivifying the law by new premises drawn from legislation. Indeed, the doctrine of the efficacy of human effort is the very essence of his philosophy.

In this connection there is one incidental illusion in the book which deserves explanation here. On page 46 occurs the following: "A late leader of the American Bar died in harness writing an elaborate argument against legislation and made generous provision in his will for a professorship in a law school whose incumbent should teach . . . the gospel of the futility of legislation." I think it ought to be added, as reflecting honor on all the parties concerned, that this refers to James C. Carter, who was wise enough in his actual will to give the trustees of Harvard University and their appointee full freedom, so that the present incumbent of the chair is Roscoe Pound himself, whose insistence that legislative enactment should be viewed as supplying new premises for the law entitles him to the gratitude of all those who wish to see the law serve human needs more effectively.

MORRIS R. COHEN.

COLLEGE OF THE CITY OF NEW YORK.

The Works of Aristotle translated into English: *De Cælo*, translated by J. L. Stocks, and *De Generatione et Corruptione*, translated by H. H. Joachim. Oxford: Clarendon Press, 1922. (New York: Oxford University Press, American Branch.) 70 pp. (268–338).

As each successive volume of the Oxford translation of Aristotle appears the magnitude of the undertaking and the prodigious scholarship applied to the task become more impressive. The translation of the two treatises comprising this volume are worthy members of a great work, and will enhance the reader's appreciation not only of Oxford scholarship but also of the range and quality of Aristotle's mind. Especially the *De Generatione et Corruptione* merits the more extensive study which this translation will give it, both for the light it throws on Aristotle's metaphysics and also for its contributions to some current philosophic problems.

Mr. Stocks' translation of the *De Cælo* is based largely on Prantl's text, and, one suspects, also on the latter's German translation and notes. Mr. Stocks' revision of Prantl's text in the light of other sources corrects numerous misprints and minor errors. One wonders whether this too prevalent textual carelessness on the part of Prantl might not have merited a more searching criticism of his translation and interpretation of Aristotle. Mr. Stocks seems to have been more successful than most translators of Aristotle in finding a mean between a translation in which a too literal following of Greek structure is supplemented by a commentary in parentheses, resulting in an unreadable grammar, and a translation which sacrifices Aristotle to style. The work is as readable as one

can reasonably expect a translation of Aristotle to be, but at the same time extensive footnotes and index references call the reader's attention to difficulties and ambiguities of translation and interpretation, as well as to comments which supplement the over-conciseness of (or, too often, attempt to over-come the difficulties in) Aristotle's thought.

The translation of the *De Generatione et Corruptione* is less readable, but logically more accurate and coherent. The matters of textual criticism are for the most part disposed of in Mr. Joachim's own edition of the treatise, an edition which reveals the most meticulous and careful criticism of the manuscripts and older editions. Mr. Joachim, therefore, has the advantage in the present volume of being able to concentrate on the thought content and logical structure of the treatise. The translation is especially admirable, from this point of view, for avoiding modern technical words which might mislead those who are unfamiliar with the Greek original, such phrases, *e.g.*, as "coming-to-be" (for "generation"), "passing-away" (for "corruption"), "adjectivals" (for "qualities"), "indivisibles" (for "atoms"). One wishes that he had continued the good work on such words as "substance," "substratum," "phenomenon," "element," *etc.* Mr. Joachim's translation approaches a little the directness of Aristotle's own use of language. But in general, even after reading these two unusually good translations, the Greek of Aristotle seems so much better adapted to the subject-matter, in spite of its foreignness, that one wonders whether, after all, Aristotle's works may not be radically incapable of translation—at least of translation into English.

HERBERT W. SCHNEIDER.

COLUMBIA UNIVERSITY.

Heredity of Wildness and Savageness in Mice. CHARLES A. COBURN. Behavior Monographs, Vol. 4, No. 5. Baltimore: Williams & Wilkins. 1922. 71 pp.

The author of this monograph has made a careful study of a difficult problem and has apparently succeeded in obtaining some highly interesting results. It is to be hoped that he will continue the study concerning the segregation of the various determining factors involved in the inheritance of wildness and savageness in mice which would necessitate, as the author has suggested, the making of many more individual matings than he has presented in the present monograph.

Mice were classified into grades of wildness and savageness ranging from zero to five, using standard criteria to judge each animal. Two strains of tame mice were used, and wild mice were trapped

and used as a basis for the wild strain. Hybrids were obtained by crossing wild females with tame males and tame females with wild males. *Inter se* matings were made of the first generation hybrids, without selection as to wildness or savageness of the individuals, and similar matings were made from second generation animals. The young mice were tested five times each at various intervals over a period of fifty-four days.

Briefly, the main results were of interest in apparently showing that it was very doubtful whether the degree of wildness or savageness of the hybrids was influenced by the fact that in one case the mating consisted of a wild female and a tame male, and in the other case a tame female and a wild male. The females as a rule attained higher grades in wildness and savageness than the males. With an increase in age and the number of tests the average grades in wildness and savageness became less.

In considering the results of the experiments in selective breeding, the author concluded that in general there was noted a tendency for the degree of wildness or savageness possessed by the parents to be reproduced in the offspring, and that probably several different inheritance factors were involved which followed Mendelian rules.

HALSEY J. BAGG.

MEMORIAL HOSPITAL,
NEW YORK CITY.

JOURNALS AND NEW BOOKS

BRITISH JOURNAL OF PSYCHOLOGY. Vol. XIII, Part 3. An Analysis of Literary Appreciation: *O. A. Wheeler.* The Effects of Tensions of the Body Surface upon the Normal Dream: *A. J. Cubberley.* Further Note on the "Theory of Two Factors": *C. Spearman.* Bilingualism and Mental Development: *F. Smith.* Hand and Ear Tests: *H. Gordon.* Some Observations on Contrast Effects in Graded Discs: *R. H. Thouless.* The Interpretation and Plotting of Output Curves: *E. Farmer.* The Constancy of the Intelligence Quotient: *P. L. Gray* and *R. E. Marsden.*

JOURNAL OF EXPERIMENTAL PSYCHOLOGY. Vol. VI, No. 1. Habituation to Rotation: *R. Dodge.* A Study of Esthetic Judgments: *K. Gordon.* A Comparison of the Scale of Values Method with the Order-of-Merit Method: *E. S. Conklin* and *J. W. Sutherland.* Performance Tests for Three-, Four-, and Five-Year-Old Children: *H. T. Woolley* and *E. Cleveland.* An Experimental Study of the Influences of Organization of Material for Memorizing Upon its Retention: *D. A. Laird, H. Remmers* and *L. J. Peterson.* A Note on the Conditioned Eyelid Reaction: *H. Cason.*

JOURNAL OF EDUCATIONAL PSYCHOLOGY. Vol. XIV, No. 2. A Second Approximation to the Curve of the Distribution of Intelligence of the Population of the United States, with a Note on the Standardization of the Stanford Revision of the Binet-Simon Scale: *P. M. Symonds.* The Graphic Rating Scale: *M. Freyd.* The Unreliability of the Difference between Intelligence and Educational Ratings: *J. C. Chapman.* Is it Necessary to Weight Exercises in Standard Tests?: *H. R. Douglas* and *P. L. Spencer.* Retention after Long Periods: *D. A. Worcester.* Drill in Arithmetic: *F. B. Knight.* A Comparison of the Essay and the Objective Type of Emaninations: *D. A. Laird.*

SCIENTIA. Vol. XXXIII, No. CXXX-2. L'expérimentation et l'observation dans la science grecque: *J. Burnet.* Cosmic Evolution. Second Part: The Organization and Dissipation of Matter through the Agency of Radiant Energy: *W. D. MacMillan.* Qu'est-ce que l'Hologénèse?: *D. Rosa.* L'étatisme et la production: *A. DeTarlé.*

Bouvier, Robert: La Pensée d'Ernst Mach. Essai de biographie intellectuelle et de critique. Paris: Librairie au Vélin d'Or. 1923. xiv + 370 pp.

Luce, A. A.: Bergson's Doctrine of Intuition. (The Donnellan Lectures for 1921.) New York: Macmillan Co.; London: Society for Promoting Christian Knowledge. 1922. 122 pp.

Malebranch: Traité de L'Amour de Dieu en quel sens il doit être désinteresse. Suivi des trois lettres au P. Lamy. Introduction et Notes de Desiré Roustan. (Collection des chefs-d'œuvre méconnus No. 135.) Paris: Éditions Bossard. 1922. 320 pp.

NOTES AND NEWS

Mr. Bernard Bosanquet died in London from heart failure on February 8th. This is a piece of news that all friends of philosophy in America must very deeply regret whether they always agreed with Mr. Bosanquet's opinions or not.

President Nicholas Murray Butler of Columbia University is to lecture before the Institut Philosophique of the University of Louvain at some convenient date in June on "La Mission de l'Université Moderne." The Institut Philosophique is directed by Monsignor S. Deploige, the successor to Cardinal Mercier in that post.